

### **REMARKS**

This responds to the Office Action dated March 9, 2009.

Claims 1, 6, 13, 25, and 58-59 are amended. Claims 1-18, 25-27, and 58-61 remain pending in this application.

#### **§ 112 Rejection of the Claims**

Claims 1-18, 25-27, and 58-61 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite.

Claims 1, 6, 13, 25, and 58 have been amended to more clearly describe the recited subject matter. Support for the amendment is found, for example, at page 7, line 7 to page 12, line 28 and page 32, lines 13-19 of the present application. It is believed that the amendment has addressed the issues raised in the rejection.

Applicant respectfully requests reconsideration and allowance of claims 1-18, 25-27, and 58-61.

#### **§102/§103 Rejections of the Claims**

Claims 1-3, 6, 9, 13-14, 17-18, 25, 58-59, and 60 were rejected under 35 U.S.C. §102(b) for anticipation by or, in the alternative, under 35 U.S.C. §103(a) as obvious over Sweeney (U.S. Patent No. 4,996,984, hereinafter "Sweeney").

#### *Claim 1*

Claim 1 has been amended to more clearly describe the recited subject matter.

Applicant respectfully traverses the rejection and submits that Sweeney, alone or in combination with reasoning given in the Office Action, do not provide the claimed subject matter. For example, Applicant is unable to find in Sweeney, among other things, a controller adapted to compute a curvature series using sample data points, identify lobes each being an excursion of more than a curvature threshold value from a baseline in the computed curvature series, generate a series of characteristic points each associated with a time of a lobe of the identified lobes in the curvature series, and determine a fundamental frequency of the sampled

signal by autocorrelating a function of the series of characteristic points, wherein the curvature series includes curvatures each computed as a non-linear function of first and second derivatives of a sampled signal at one of the sample data points, as recited in claim 1. Applicant is also unable to find a reason in the Office Action that addresses these deficiencies of Sweeney.

The Office Action states, in paragraph 6:

Examiner also considers that each characteristic point (e.g. any sampled point of the signal) is associated with a time of a lobe in the curvature series (any series of individual points that make up a signal) as a function of the sampled signal. Examiner interprets this current limitation to only require that the series of sampled data points, which correspond to a time of a lobe because all points will correspond to a temporal lobe curvature.

Applicant respectfully disagrees. Claim 1 recites a curvature series including curvatures each computed as a non-linear function of first and second derivatives of a sampled signal at one of the sample data points (thus not merely “any sampled point of the signal”) and lobes each being an excursion of more than a curvature threshold value from a baseline in the computed curvature series (thus not corresponding to “all points”). Therefore, Sweeney does not appear to compute the curvature series and identify the lobes from the curvature series as recited in claim 1.

Applicant respectfully requests reconsideration and allowance of claim 1.

#### *Claims 2-3*

Applicant respectfully traverses the rejection. Claims 2-3 are dependent on claim 1, which is believed to be patentable as discussed above. Therefore, the discussion above for claim 1 is incorporated herein to support the patentability of claims 2-3.

Applicant respectfully requests reconsideration and allowance of claims 2-3.

#### *Claim 6*

Claim 6 has been amended to more clearly describe the recited subject matter.

Applicant respectfully traverses the rejection and submits that Sweeney, alone or in combination with reasoning given in the Office Action, do not provide the claimed subject matter. For example, Applicant is unable to find in Sweeney, among other things, calculating a series of curvatures each as a non-linear function of first and second derivatives of a cardiac signal at one of a sample data points, and identifying lobes each being an excursion of more than a curvature threshold value from a baseline in the calculated series of curvatures, as recited in

claim 6. Applicant is also unable to find a reason in the Office Action that addresses these deficiencies of Sweeney.

Because claims 1 and 6 are rejected on the same ground, the discussion for claim 1 above is incorporated herein to further support the patentability of claim 6.

Applicant respectfully requests reconsideration and allowance of claim 6.

*Claim 9*

Applicant respectfully traverses the rejection. Claim 9 is dependent on claim 6, which is believed to be patentable as discussed above. Therefore, the discussion above for claim 6 is incorporated herein to support the patentability of claim 9.

Applicant respectfully requests reconsideration and allowance of claim 9.

*Claim 13*

Claim 13 has been amended to more clearly describe the recited subject matter.

Applicant respectfully traverses the rejection and submits that Sweeney, alone or in combination with reasoning given in the Office Action, do not provide the claimed subject matter. For example, Applicant is unable to find in Sweeney, among other things, using a processor to generate a curvature series by computing curvatures each as a non-linear function of first and second derivatives at a sample point of a sampled input signal, and identifying lobes each being an excursion from a baseline in the curvatures series using a curvature threshold value, as recited in claim 13. Applicant is also unable to find a reason in the Office Action that addresses these deficiencies of Sweeney.

Because claims 1 and 6 are rejected on the same ground, the discussion for claim 1 above is incorporated herein to further support the patentability of claim 13.

Applicant respectfully requests reconsideration and allowance of claim 13.

*Claims 14 and 17-18*

Applicant respectfully traverses the rejection. Claims 14 and 17-18 are dependent on claim 13, which is believed to be patentable as discussed above. Therefore, the discussion above for claim 13 is incorporated herein to support the patentability of claims 14 and 17-18.

Applicant respectfully requests reconsideration and allowance of claims 14 and 17-18.

#### *Claim 25*

Claim 25 has been amended to more clearly describe the recited subject matter.

Applicant respectfully traverses the rejection and submits that Sweeney, alone or in combination with reasoning given in the Office Action, do not provide the claimed subject matter. For example, Applicant is unable to find in Sweeney, among other things, generating a curvature series using sampled data points by computing curvatures each as a non-linear function of first and second derivatives of a sampled cardiac signal at one of the sampled data points, and identifying lobes each being an excursion of more than a curvature threshold value from a baseline in the curvature series, as recited in claim 25. Applicant is also unable to find a reason in the Office Action that addresses these deficiencies of Sweeney.

Because claims 1 and 25 are rejected on the same ground, the discussion for claim 1 above is incorporated herein to further support the patentability of claim 25.

Applicant respectfully requests reconsideration and allowance of claim 25.

#### *Claim 58*

Claim 58 has been amended to more clearly describe the recited subject matter.

Applicant respectfully traverses the rejection and submits that Sweeney, alone or in combination with reasoning given in the Office Action, do not provide the claimed subject matter. For example, Applicant is unable to find in Sweeney, among other things, generating a first curvature series using first sampled data points by calculating curvatures each as a non-linear function of first and second derivatives of a first sampled signal at one of the first sampled data points, generating a second curvature series using second sampled data points by calculating curvatures each being a non-linear function of first and second derivatives of a second sampled signal at one of the second sampled data points, identifying first lobes each being an excursion from a baseline in the first curvature series using a first curvature threshold value, and identifying second lobes each being an excursion from a baseline in the second curvature series using a second curvature threshold value, as recited in claim 58. Applicant is also unable to find a reason in the Office Action that addresses these deficiencies of Sweeney.

Because claims 1 and 58 are rejection on the same ground, the discussion for claim 1 above is incorporated herein to further support the patentability of claim 58.

Applicant respectfully requests reconsideration and allowance of claim 58.

#### *Claims 59-60*

Applicant respectfully traverses the rejection. Claims 59-60 are dependent on claim 58, which is believed to be patentable as discussed above. Therefore, the discussion above for claim 58 is incorporated herein to support the patentability of claims 59-60.

Applicant respectfully requests reconsideration and allowance of claims 59-60.

#### § 103 Rejection of the Claims

Claims 4-5, 11-12, 15-16, and 61 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sweeney as applied above.

Applicant respectfully traverses the rejection. Claims 4-5 are dependent on claim 1. Claims 11-12 are dependent on claim 6. Claims 15-16 are dependent on claim 13. Claim 61 is dependent on claim 58. Claims 1, 6, 13, and 58 are believed to be patentable as discussed above. Applicant is unable to find additional reasoning in the Office Action that remedies the deficiency of the rejection of claims 1, 6, 13, and 58 using Sweeney as discussed above. Therefore, the discussions above for claims 1, 6, 13, and 58 are incorporated herein to support the patentability of claims 4-5, 11-12, 15-16, and 61.

Applicant respectfully requests reconsideration and allowance of claims 4-5, 11-12, 15-16, and 61.

Claims 7-8, 10, and 26-27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sweeney as applied above in view of Marcus (U.S. Patent No. 4,637,400, hereinafter "Marcus").

Applicant respectfully traverses the rejection. Claims 7-8 and 10 are dependent on claim 6. Claims 26-27 are dependent on claim 25. Claims 6 and 25 are believed to be patentable as discussed above. Marcus does not appear to remedy the deficiency of the rejection of claims 6

and 25 using Sweeney as discussed above. Therefore, the discussions above for claims 6 and 25 are incorporated herein to support the patentability of claims 7-8, 10, and 26-27.

Applicant respectfully requests reconsideration and allowance of claims 7-8, 10, and 26-27.

### CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance, and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's representative at (612) 373-6965 to facilitate prosecution of this application.

If necessary, please charge any additional fees or deficiencies, or credit any overpayments to Deposit Account No. 19-0743.

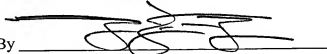
Respectfully submitted,

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Date

June 8, 2009

By

  
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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 8th day of June 2009.

Kate Gannon

Name

  
Signature